International Journal of Textile
and Fashion Technology (IJTFT)
ISSN(P): 2250-2378; ISSN(E): 2319-4510
Vol. 5, Issue 6, Dec 2015, 1-18

"DEVELOPMENT OF NATURAL DYE WITH FRAGRANCE FINISHED PETTICOAT WITH BAMBOO/POLYESTER BLENDED WOVEN FABRIC"

P. SASIKALA[1] & R. SHALINI[2]

[1]*Assistant Professor, Department of Costume Design & Fashion, PSG College of Arts & Science, Coimbatore, Tamil Nadu, India*

[2]*Mphil Scholar, Department of Costume Design & Fashion, PSG College of Arts & Science, Coimbatore, Tamil Nadu, India*

ABSTRACT

The present study focus on the development of Petticoat with Bamboo/Polyester 30s and 40s count blended woven fabric. Natural dye was extract from Catechu powder applying mordant technique. Fragrance was given to the fabric by using Lavender oil by applying padding mangle method. Various parameters of the yarn properties, Fabric analysis properties: Ends per inch/ Picks per inch, Fabric Thickness, Fabric Weight, Tensile Strength, Abrasion Resistance, Bursting Strength, Stiffness, Crease Recovery, Wick Ability, Air Permeability, Water Drop Absorption, Water Vapor Permeability, Light fastness, Rubbing fastness tests were evaluated. Moreover the fabric quality was tested for washing property up to 20 washes and the quality of the fabric was assessed. Results revealed that the blending property of Bamboo/Polyester 30s and Bamboo/Polyester 40s count was good when compared to any other fibers. Further as an application part woven fabric was also designed for children (girls), which showed a good compatibility and dermally safe product. This study way for the usage of eco-friendly and dermatologically safe woven fabrics from Bamboo/Polyester 30sand Bamboo/Polyester 40s count.

KEYWORDS: Bamboo/Polyester 30s And 40s Count, Catechu Dye, Lavender Finishing, Woven Petticoat

Received: Oct 06, 2015; **Accepted:** Oct 14, 2015; **Published:** Oct 20, 2015; **Paper Id.:** IJTFTDEC20151

INTRODUCTION

Textile fiber reinforced composite materials are an important class of engineering materials. They offer outstanding mechanical properties, unique flexibility in design capabilities and ease of fabrication. Composites using high strength fibers such as graphite, aramid and glass are commonly used in broad range of applications from aerospace structure to automotive part and building materials to sporting goods (Shanmuga sundharam, O. L 2009).

Bamboo textiles are cloth, yarn, and clothing made out of bamboo fibers. While historically used only for structural elements, such as bustles and the ribs of corsets, in recent years a range of technologies have been developed allowing bamboo fiber to be used in a wide range of textile and fashion applications. Modern bamboo clothing is clothing made from either 100% bamboo yarn or a blend of bamboo and cotton yarn. The bamboo yarn can also be blended with other textile fibers such as hemp or even spandex. In the West, bamboo, alongside other components such as whalebone and steel wire, was sometimes used as a structural component in corsets, bustles and other types of structural elements used in fashionable women's dresses (Okubo K., Ohkita 2004).

Bamboo is extremely resilient and durable as a fiber. In studies comparing it to cotton and polyester, it is found to have a high breaking tenacity, better moisture-wicking properties, and better moisture absorption. In superseding these other fibers in these various areas, supporters of bamboo fiber products and goods tout it as more eco-friendly than cotton and polyester. Especially, bamboo fibers due to its environmental sustainability, mechanical properties, and recyclability have been utilized as reinforced polymer matrix composite in construction industries (Moe Thwe KL 2003).

Polyester is a term often defined as “long-chain polymers chemically composed of at least 85% by weight of an ester and a dihydric alcohol and a terephthalic acid”. In other words, it means the linking of several esters within the fibers. Reaction of alcohol with carboxylic acid results in the formation of esters. The most common polyester or staple fiber is usually composed of polyethylene terephthalate polymers. Polyester can also be classified as saturated and unsaturated polyesters (Sheshachala D, Sandeep D. N 2008).

Indians have been considered as forerunners in the art of natural dyeing. Natural dyes find use in the coloring of textiles, drugs, cosmetics, etc. Owing to their non-toxic effects, they are also used for coloring various food products. In India, there are more than 450 plants that can yield dyes. In addition to their dye-yielding characteristics, some of these plants also possess medicinal value. Though there is a large plant resource base, little has been exploited so far. Due to lack of availability of precise technical knowledge on the extracting and dyeing technique, it has not commercially succeeded like the synthetic dyes (Siva 2007).

The Present Work was Framed with the following Objectives

- To select natural regenerated fiber and man-made fiber
- To blend the selected fibers through spinning process (70:30)
- To blend the selected yarns through weaving process
- To study the difference between the different counts 30’s and 40’s.
- To evaluate the physical properties and mechanical properties.
- To test the quality aspects of the fabrics.
- To finish the fabric natural dye with fragrance.
- To develop petticoat.

EXPERIMENTAL PROCEDURE

Selection of Fiber
(Bamboo 100% Polyester 100%)

↓

Selection of Blending

(Bamboo/Polyester 70:30 Ratio)

↓

Selection of Yarn

(30'S Bamboo/polyester and 40's Bamboo/polyester)

↓

The process of yarn formation

↓

Selection of Fabric formation

(Weaving - Plain weave Structure)

↓

Finishing

(Natural Dye with Fragrance finish)

↓

End Product (Woven cloth Petticoat)

Selection of Fibers

The 100 percentage regenerated bamboo fiber and polyester fiber are selected for this study.

Selection of Blending Method

Regenerated bamboo fiber with polyester blended in 70:30 ratios. Blending was done in yarn stage.

Selection of Yarn Formation Method

30s and 40s the different counts of bamboo/polyester yarn is selected for this study.

Blending different types of fibers is a widely practiced means of enhancing the performance and the aesthetic qualities of a fabric. Carding partially aligns the fibers and forms them in to a thin web, here blending bamboo and polyester fibers were done at this stage with 70:30 ratio. At first stage bamboo and polyester fibers were manually opened and mixed at the required ratio of 70% bamboo and 30% polyester respectively. Blended yarns from natural and man-made fibers have the particular advantage of successfully combining the good properties of both fiber components, such as comfort of wear with easy care properties. These advantages also permit an increased variety of products to be made and yield a stronger marketing advantage (Pan N 2000).

Selection of Fabric Formation

Weaving method used for fabric formation.

Weaving production of fabric by interlacing two sets of yarns so that they cross each other, normally at right angles, usually accomplished with a hand- or power-operated loom. In weaving, lengthwise yarns are called warp; crosswise yarns are called weft, or filling. One warp thread is called an end and one weft thread is called a pick. The yarn count and number of warp and filling yarns to the square inch determine the closeness or looseness of a weave. Woven

fabrics may also be varied by the proportion of warp yarns to filling yarns. Some effects are achieved by the selection of yarns or of combinations of yarns (Dooley, William H 2011).

Selection of Weaving Method

Plain weave used for this weaving method.

In the plain weave each filling yarn passes over and under the warp yarns, with the order reversed in alternating rows. Weaving can be summarized as a repetition of these three actions, also called the primary motion of the loom. The weaving process consists of five basic operations, shedding, picking, and beating-up, left off and take up.

The warp is divided into two overlapping groups, or lines (most often adjacent threads belonging to the opposite group) that run in two planes, one above another, so the shuttle can be passed between them in a straight motion. Then, the upper group is lowered by the loom mechanism, and the lower group is raised (shedding), allowing to pass the shuttle in the opposite direction, also in a straight motion. Picking or Filling to passing the weft yarn (pick) across the warp threads through the shed. Let off to the warp yarns are unwound from the warp beam during the above three processes. Take up liver the woven fabric is wound on the cloth beam during the above three processes. Repeating these actions form a fabric mesh but without beating-up. Fabrics made in the plain weave include percale, muslin, and taffeta (Encyclopeadia Britannica 2015).

The above operations must be synchronized to occur in the correct sequence and not interfere with one another. The full sequence is repeated for the insertion and interlacing of each weft yarn length with the warp yarns, and is therefore called 'The Weaving Cycle'.

SELECTION OF FINISHING METHOD

The fabric samples 30s Bamboo/ Polyester and 40s Bamboo/ Polyester were finished coloring method of natural dyeing and fragrance finishing are used.

NATURAL DYE FINISH

Selection of Dye Finish

To select the dye finishing was Catechu dye powder applying to woven fabric. The fabric samples 30s Bamboo/ Polyester and 40s Bamboo/ Polyester were finished coloring was natural dyeing used mordant technique.

Selection of the Raw Materials

Catechu powder was used for developing dye. It is available in our college wet processing laboratory. It was selected based on its higher availability and its color.

Selection of the Mordant

The mordant is known as dye fixing agent, which helps for fix the dye into fabric uniformly. The mordant such as washing soda and copper sulphate was used for this study.

Procedure for Dye Extraction

The dye was extracted from catechu powder. The dyes are not extracted by any other technical equipment it was done manually. 400gram powder and stainless vessel are taken and mixing in 5 liter purified water. The solution was

boiled with water to obtain dye and filtered by muslin cloth; the remaining waste particles were discarded.

Dye Application on the Fabric

The catechu extract was applied on the woven material for natural dye finish using following methods.

Recipe

The methodology adopted for dyeing process are as follows, the ingredients used for developing dye is;

Catechu Extract: 5 liter

Water: 1 liter

Washing Soda: 1:2 (12 grams)

Copper Sulphate: 1% (8 grams)

Temperature: 75˚C

Time: 1:30 hrs

Dyeing Procedure

The 5 liter extract with add 1 liter purified water was boiled, at the temperature of 75˚C. At the same time 12 gram washing soda add with the dyeing solution and stirrer well. Same time the wet fabric was heated in the water medium contained dye and washing soda for 1 hour. Then this process 8 gram copper sulphate was heated with 4 liter water the dyed fabric transferred into again it was heated around 30 minutes with medium temperature. Then the fabric was washed in cold water and dried in shadow.

FRAGRANCE FINISH

Selection of Fragrance Finish

To select the fragrance finishing was Lavender Oil applying to woven fabric. The fabric samples 30s Bamboo/ Polyester and 40s Bamboo/ Polyester were finished padding mangle method used.

Selection of Lavender Oil

Lavender is particularly rich in aromatic molecules called esters, which are antispasmodic, pacifying and tonic, while other molecules give it its antiviral, bacterial and anti-inflammatory powers. The following headings are explained applying Lavender finishing method.

Procedure

The lavender oil was purchased from Nilgiris. The purchased oil was diluted in the ratio of 1:50 before applying to the woven fabric.

Selection of Binder

The binder is a film forming agent made up of long chain macromolecules which when applied to the textile together with the pigments produces a three dimensionally linked network. The binder should be colorless, odorless, evenly thick, smooth and good adhesion. Citric acid is a good cross linking agent or binder in spite of its low cost, wide spread availability and ecological acceptability.

Recipe

Diluted essential oil - 10% of the fabric weight

Material liquor ratio - 1:50

Temperature - 160˚C

Wet pickup - 100%

Duration - 5 minutes

Application of Lavender Oil on the Fabric

The diluted Lavender oil was applied on the woven material for fragrance finish using following methods.

Padding Mangle Method

Application of finish by padding is more convenient and many of the problems related to exhaust techniques can be avoided primarily in padding stage. In padding technique, the fabric was passed through two iron rollers revolving at different speed in opposite direction. The solutions were prepared based on the recipe and woven fabric Bamboo/Polyester was finished with the optimized parameters. The extracted solution was poured inside the padding mangle then the All the samples were padded in a padding mangle at a pressure of 3 psi with 100% wet pickup followed by drying and curing at 160°C for 5 min and rpm speed was set at 30.

Fabrics is padded and cured inside the dry oven for 15 minutes for good penetration of the finishing agents. Then the fabric was removed from the curing chamber. Finally the fabric was dried in shade.

PRODUCT DEVELOPMENT

The end product developed was woven cloth petticoat from Bamboo/Polyester 30s and 40s count. It is made from natural regenerated fiber and manmade polyester fibers. These fibers selected 100 percentage Bamboo and 100 percentages Polyester fibers developed 70:30 ratio blended. Then made 30s and 40s count yarn and Bamboo/Polyester woven cloth. This cloth is not causes skin allergies. Then to applied Natural dye coated Lavender finishing to the woven cloth. Finally produced the petticoat for children's wear garment from the woven cloth.

RESULTS AND DISCUSSIONS

Evaluation of Yarn Properties

Evaluation of Lea Strength

The following results of (Table 1), Lea Strength was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended yarn with different counts (Figure 1).

Table 1: Lea Strength of the Selected Yarn

Samples	Lea Strength (Kg)	T Value
Bamboo/Polyester 30s	74	6.06
Bamboo/Polyester 40s	89	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count yarns when compared, while Bamboo/Polyester 40s is greater than 30s count yarn.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count yarns is significant, because the p value is less than the level of significant i.e. (P<0.05). So the hypothesis is significant difference between two variables.

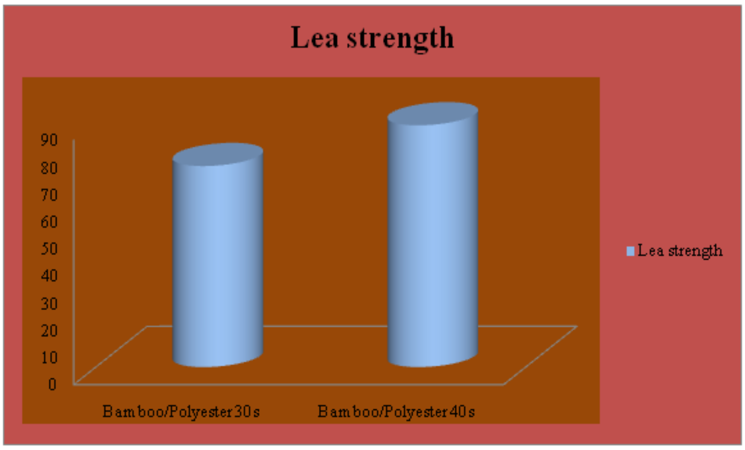

Figure 1: Lea Strength of the Selected Yarn

Evaluation of Single Yarn Twist

The following results of (Table 2), Single Yarn Twist was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended yarn with different counts (Figure 2).

Table 2: Single Yarn Twist of the Selected Yarn

Samples	Single Yarn Twist (Kg)	T Value
Bamboo/Polyester 30s	18.4	8.96
Bamboo/Polyester 40s	21.9	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count yarns when compared, while Bamboo/Polyester 40s is greater than 30s count yarn.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count yarns is significant, because the p value is less than the level of significant i.e. (P<0.05). So the hypothesis is significant difference between two variables.

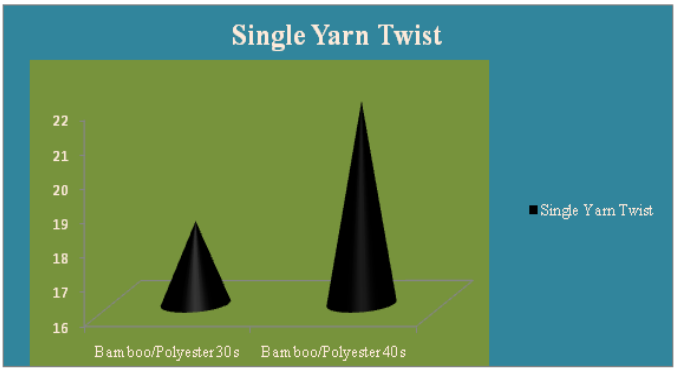

Figure 2: Single Yarn Twist of the Selected Yarn

EVALUATION OF GEOMETRIC PROPERTIES

Ends per inch/ Picks per inch

The following results of (Table 3), Ends per inch and Picks per inch were obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 3).

Table 3: EPI/PPI of the Selected Fabrics

Samples	Ends/ Inch	Picks/ Inch	T Value	
			EPI	PPI
Bamboo/Polyester 30s	65	69	6.12	4.91
Bamboo/Polyester 40s	59	67		

The samples Bamboo/Polyester 30s and 40s Ends per inch and Picks per inch fabric when compared, while Picks per inch greater than Ends per inch of the fabric. Both Bamboo/Polyester 30s and 40s when compared, while Bamboo/Polyester 30s is greater than 40s count fabric Ends per inch and Picks per inch.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is significant, because the p value is less than the level of significant i.e. ($P<0.05$). So the hypothesis is significant difference between two variables.

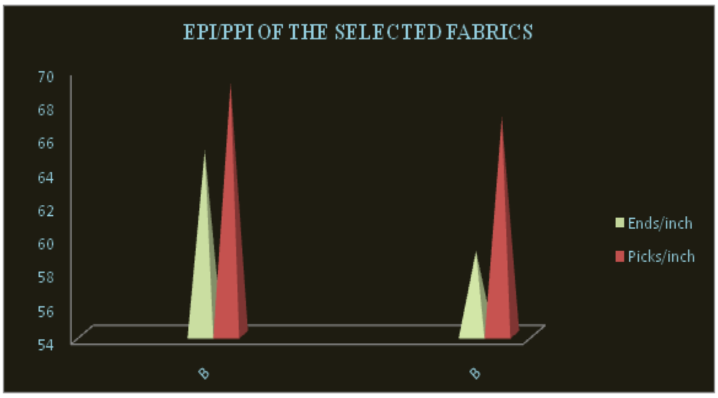

Figure 3: EPI/PPI of the Selected Fabrics

Fabric Thickness

The following results of (Table 4), Fabric Thickness was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 4).

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count yarns when compared, while Bamboo/Polyester 30s and 40s after finishing greater than before finishing of fabric thickness. To increase the fabric thickness was after finishing. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 40s is greater than 30s count fabric thickness is before and after finishing.

Table 4: Fabric Thickness of the Selected Fabrics

Samples	Before Finishing (Mm)	After Finishing (Mm)	T-Value
Bamboo/Polyester 30s	0.28	0.31	1.41
Bamboo/Polyester 40s	0.31	0.34	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is not significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is not significant difference between two variables.

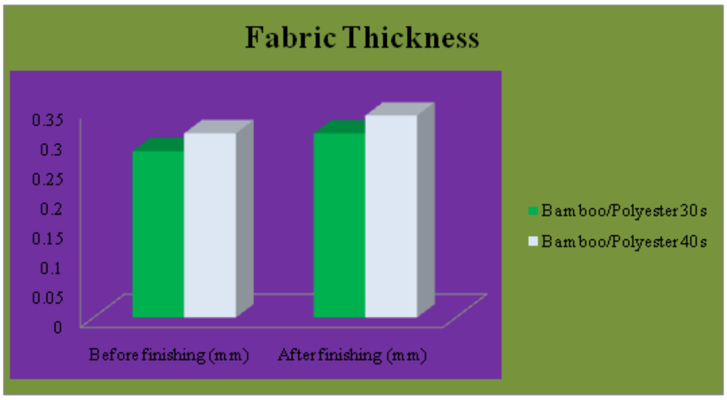

Figure 4: Fabric Thickness of the Selected Fabrics

Fabric Weight Grams per Square Meter (GSM)

The following results of (Table 5), Fabric Weight was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 5).

Table 5: Fabric Weight Grams per Square Meter (GSM)

Samples	Before Finishing (GSM)	After Finishing (GSM)	T-Value
Bamboo/Polyester 30s	3.17	2.11	1.08
Bamboo/Polyester 40s	2.68	1.78	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count yarns when compared, while Bamboo/Polyester 30s and 40s after finishing decrease the fabric weight. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 30s is greater than 40s count fabric weight is before and after finishing.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is not significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is not significant difference between two variables.

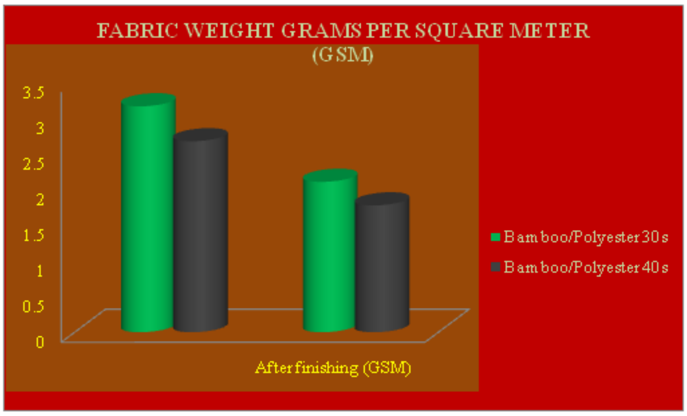

Figure 5: Fabric Weight Grams per Square Meter (GSM)

EVALUATION OF MECHANICAL PROPERTIES

Evaluation of Tensile Strength

The following results of (Table 6), Tensile Strength was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 6).

Table 6: Tensile Strength of the Selected Fabrics

Samples	Warp Strength (kg)	Warp Elongation (%)	Weft Strength (kg)	Weft Elongation (%)	T value	
					Warp	Weft
Bamboo/Polyester 30s	40.86	7.5	35.33	10.75	13.44	4.02
Bamboo/Polyester 40s	45.52	9.73	39.47	20.69		

The samples Bamboo/Polyester 30s and 40s Tensile Strength of fabric when compared, Warp strength, Warp elongation, Weft strength, Weft elongation while, Bamboo/Polyester 40s greater than 30s. Both samples of Bamboo/Polyester 30s and 40s when compared, while Bamboo/Polyester 40s is greater than 30s count Tensile Strength of the fabric.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric warp is significant, because the p value is less than the level of significant i.e. ($P<0.05$). Weft is not significant, because the p value is greater than the level of significant i.e. ($P<0.05$). So the hypothesis warp is significant and weft is not significant difference between two variables.

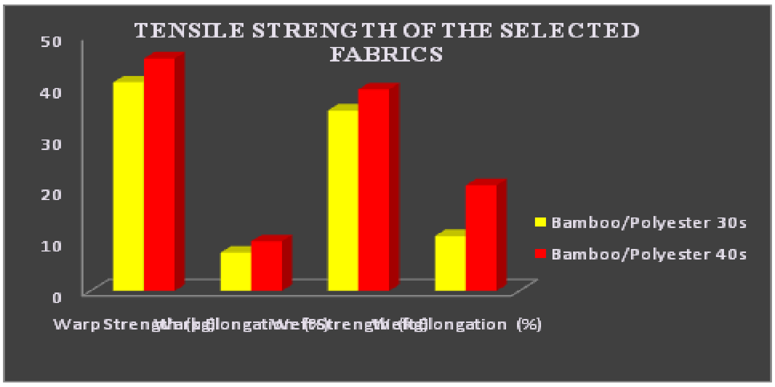

Figure 6: Tensile Strength of the Selected Fabrics

Evaluation of Abrasion Resistance

The following results of (Table 7), Abrasion Resistance was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 7).

Table 7: Abrasion Resistance of the Selected Fabrics

Samples	Before Finishing			After Finishing			T value
	Before Wt(Gm)	After Wt(Gm)	Wt. Loss GSM(Gm)	Before Wt(Gm)	After Wt(Gm)	Wt. Loss GSM(Gm)	
Bamboo/Polyester 30s	0.115	0.100	0.015	0.135	0.130	0.005	8.66
Bamboo/Polyester 40s	0.150	0.140	0.010	0.170	0.170	0	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s and 40s after finishing the abrasion resistance to increase the fabric weight. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 40s is greater than 30s count fabric weight is before and after finishing.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is significant, because the p value is less than the level of significant i.e. ($P<0.05$). So the hypothesis is significant difference between two variables.

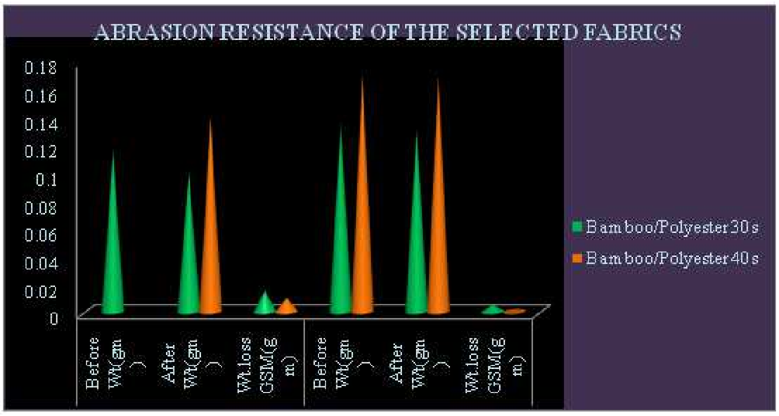

Figure 7: Abrasion Resistance of the Selected Fabrics

Evaluation of Bursting Strength

The following results of (Table 8), Bursting Strength was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 8).

Table 8: Bursting Strength of the Selected Fabrics

Samples	Before Finishing (Kg/Cm^2)	After Finishing (Kg/Cm^2)	T-Value
Bamboo/Polyester 30s	11	9	0.83
Bamboo/Polyester 40s	13	10	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s and 40s after finishing the bursting strength to decrease the fabric. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 40s is greater than 30s count bursting strength is before and after finishing.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is not significant, because the p value is greater than the level of significant i.e. ($P>0.05$). So the hypothesis is not significant difference between two variables.

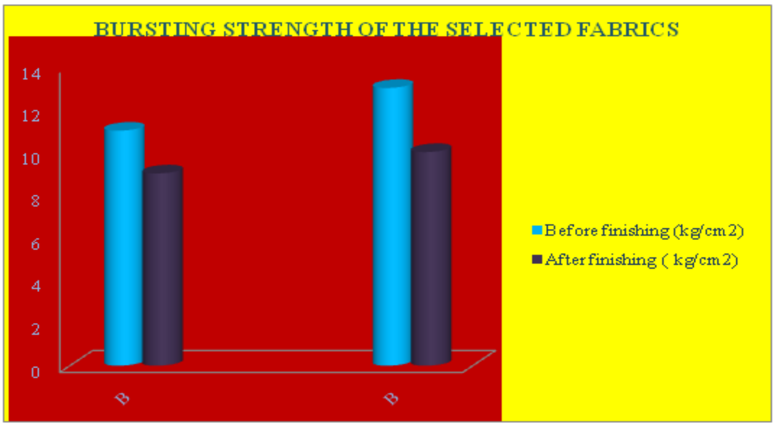

Figure 8: Bursting Strength of the Selected Fabrics

EVALUATION OF COMFORT PROPERTIES

Evaluation of Stiffness

The following results of (Table 9), Fabric Stiffness was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 9).

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s and 40s after finishing the warp and weft yarn to decrease the fabric stiffness. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 30s is greater than40s count fabric stiffness is before and after finishing.

Table 9: Stiffness of Selected Fabric

Samples	Before Finishing (Inches)		After Finishing (Inches)		T Value	
	Warp	Weft	Warp	Weft	Warp	Weft
Bamboo/Polyester 30s	8.74	8.70	7.35	7.32	0.26	0.27
Bamboo/Polyester 40s	8.33	8.29	7.32	7.27		

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric warp and weft is no significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is not significant difference between two variables.

Figure 9: Stiffness of Selected Fabric

Evaluation of Crease Recovery

The following results of (Table 10), Crease Recovery was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 10).

Table 10: Crease Recovery of Selected Fabric

Samples	Before Finishing (Degrees)		After Finishing (Degrees)		T Value	
	Warp	Weft	Warp	Weft	Warp	Weft
Bamboo/Polyester 30s	85	105	82	103.2	9.7	16.92
Bamboo/Polyester 40s	65	75	64.1	72		

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s and 40s after finishing the warp and weft fabric to decrease the crease recovery. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 30s is greater than40s count crease recovery is before and after finishing.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric warp and weft is significant, because the p value is less than the level of significant i.e. ($P<0.05$). So the hypothesis is significant difference between two variables.

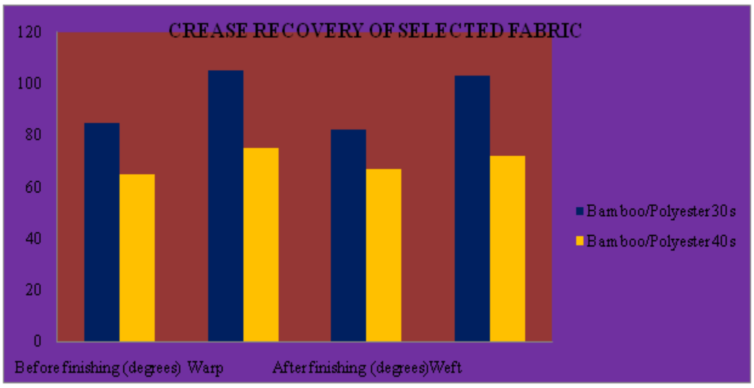

Figure 10: Crease Recovery of Selected Fabric

EVALUATION OF ABSORPTION PROPERTIES

Evaluation of Wick Ability

The following results of (Table 11), Wick Ability was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 11).

Table 11: Wick Ability of Selected Fabric

Samples	Wick Ability (Mm)	T Value
Bamboo/Polyester 30s	54	0.64
Bamboo/Polyester 40s	56	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 40s is greater than 30s count of fabric wick ability.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is no significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is no significant difference between two variables.

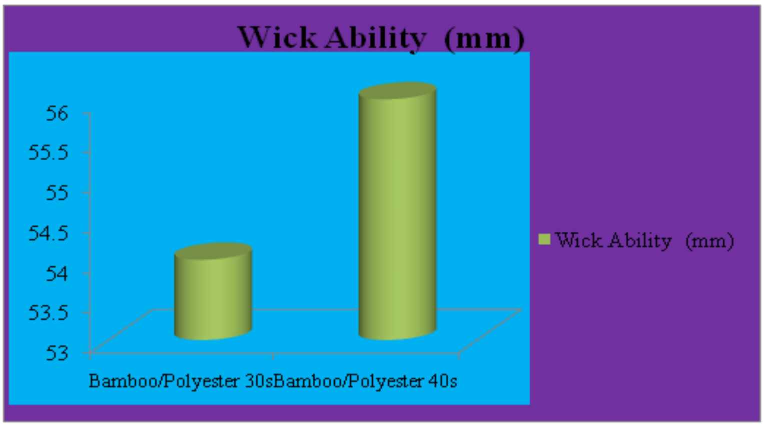

Figure 11: Wick Ability of Selected Fabric

Evaluation of Air Permeability

The following results of (Table 12), Air Permeability was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 12).

Table 12: Air Permeability of Selected Fabric

Samples	Before Finishing ($Cm^3/S/Cm^2$)	After Finishing ($Cm^3/S/Cm^2$)	T-Value
Bamboo/Polyester 30s	302	405	1.27
Bamboo/Polyester 40s	298	342	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s and 40s after finishing the air permeability to increase the fabric. Both samples are Bamboo/Polyester 30s and 40s when compared; while Bamboo/Polyester 30s is greater than 40s count air permeability is before and after finishing.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is not significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is not significant difference between two variables.

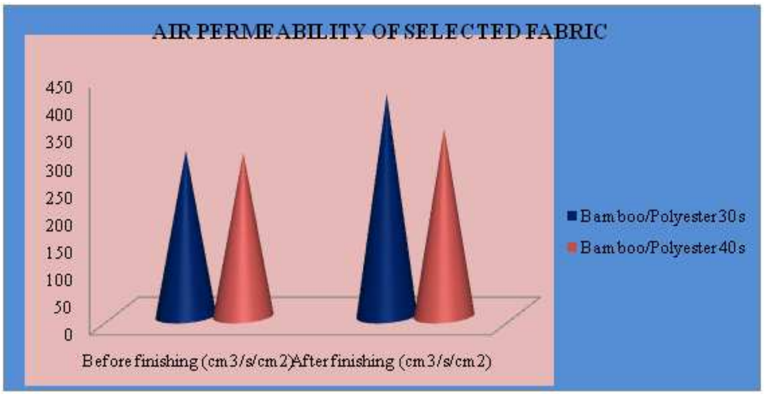

Figure 12: Air Permeability of Selected Fabric

Evaluation of Water Drop Absorption

The following results of (Table 13), Water Drop Absorption was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 13).

Table 13: Water Drop Absorption of Selected Fabric

Samples	Absorption (Sec)	T Value
Bamboo/Polyester 30s	4.8	0.35
Bamboo/Polyester 40s	5.2	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 40s is greater than 30s count of fabric water absorption.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is no significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is no significant difference between two variables.

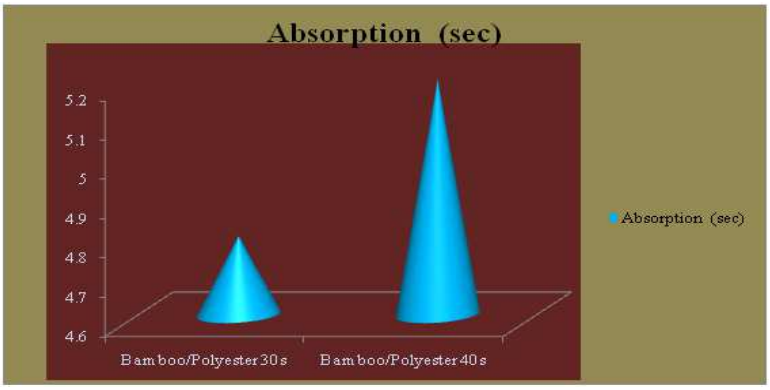

Figure 13 Water Drop Absorption of Selected Fabric

Evaluation of Water Vapor Permeability

The following results of (Table 14), Water Vapor Permeability was obtained for Bamboo/Polyester 30s and Bamboo/Polyester 40s blended fabric with different counts (Figure 14).

Table 14: Water Vapor Permeability of Selected Fabric

Samples	Water Vapor Permeability (%)	T Value
Bamboo/Polyester 30s	56	0.15
Bamboo/Polyester 40s	54	

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s is greater than 40s count of fabric water vapor permeability.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric is no significant, because the p value is greater than the level of significant i.e. (P>0.05). So the hypothesis is no significant difference between two variables.

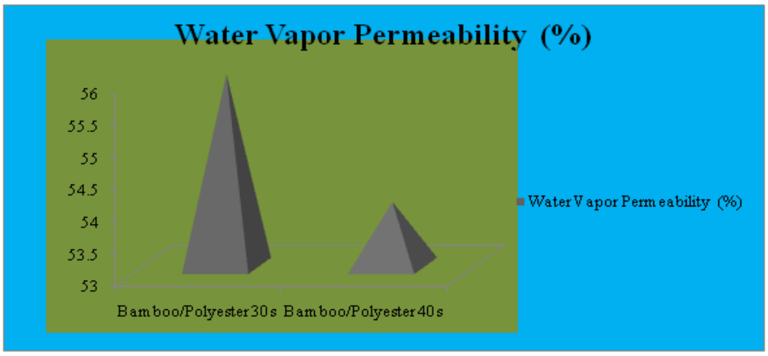

Figure 14: Water Vapor Permeability of Selected Fabric

COLOUR FASTNESS

Evaluation of Light Fastness

The quality assessment was carried out with the help of 25 members who have the knowledge on fabric quality. The results of the analysis presented in Table 15 and Figure 15.

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s is greater than 40s count of fabric was high value for light fastness.

Table 15: Light Fastness Selected Fabric

Quality Grades	Bamboo/Polyester 30s	Bamboo/Polyester 40s
Excellent	94	80
Very good	6	14
Good	0	6
Fair	0	0
Poor	0	0

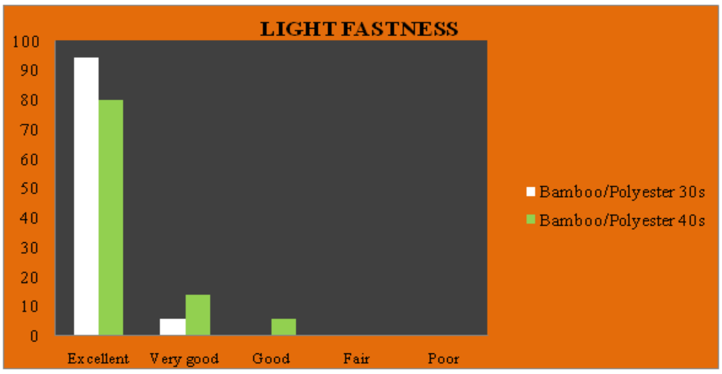

Figure 15: Light Fastness Selected Fabric

Evaluation of Rubbing Fastness

From the Table 16, the quality assessment was carried out with the help of 25 members who have the knowledge on fabric quality the following results were obtained for the Rubbing fastness assessed by wet rubbing and dry rubbing of the blended Bamboo/Polyester 30s and 40s finished fabric in Figure 16.

Table 16: Rubbing Fastness of Selected Fabric

Samples	Wet Rubbing	Dry Rubbing
Bamboo/Polyester 30s	89	97
Bamboo/Polyester 40s	85	92

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, while Bamboo/Polyester 30s is greater than 40s count of fabric was high value for wet and dry rubbing fastness.

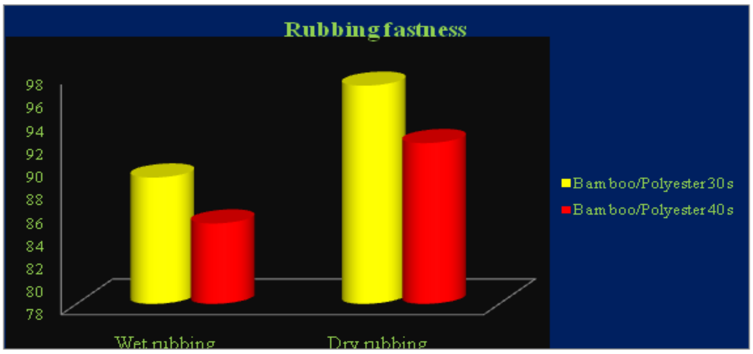

Figure 16: Rubbing Fastness of Selected Fabric

Evaluation of Washing Fastness

From the Table 17, the quality assessment was carried out with the help of 25 members who have the knowledge on fabric quality the following results were obtained for the Washing fastness of the blended Bamboo/Polyester 30s and 40s finished fabric Figure 17.

Table 17: Evaluation of Washing Fastness

Samples	15 Washes	20 Washes
Bamboo/Polyester 30s	83	75
Bamboo/Polyester 40s	95	79

The samples Bamboo/Polyester 30s and Bamboo/polyester 40s count fabric when compared, same result Bamboo/Polyester 40s and 30s count of fabric washing fastness was 30s greater than 40s washes are excellent value for washing.

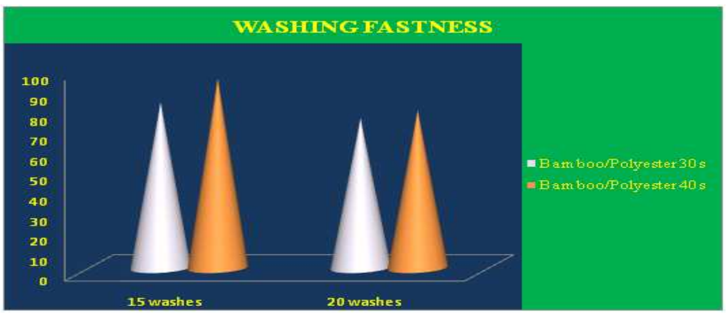

Figure 17: Washing Fastness of Selected Fabric

CONCLUSIONS

From the research it could be concluded, that bamboo/polyester 30s and bamboo/polyester 40s count possess all the desired properties that are required for apparel. The above fabric is finished with natural dye and fragrance finish increases the awareness about the herb and also effective utilization of the same.

While comparing the all the above fabrics it is concluded that blended 70:30 ratio bamboo/polyester 30 and bamboo/polyester 40s count has much more properties and excellent results.

Thus the end product woven petticoat from bamboo/polyester 30 and bamboo/polyester 40s count will face the demand of green consumers with welcoming hands. The search of innovative blended natural regenerated with various finishes for textile and fashion industries can be fulfilled with theses fabrics.

REFERENCES

1. *Booth, J. E., (2002), "Principles of Textile Testing", C.B.S. Publishers, Delhi. Bus Rev;4:100–7.*
2. *BS Handbook II., (1974), "Methods of Test for Textiles", British Standards Institution, London.*
3. *Dooley and William H., (2011), "Project Gutenberg Textiles" (Project Gutenberg ed.), Boston, USA: D.C. Heath and Co., retrieved 30 October.*
4. *Encyclopeadia Britannica., (2015), "Illustrated Guide of Tilling and Weaving", Published in China*
5. *Moe Thwe K. L., (2003), "Environmental effects on bamboo–glass/polypropylenehybrid composites", Jouranl, Mater Sci;8:363–76.*
6. *Okubo k and Ohkita., (2004), "Development of bamboo-based polymer composites and their mechanical properties", Compos: Part A: ApplSciManuf; 35:377–83.*
7. *Pan N., (2000), "Strength of Twisted Blend Fibrous Structures: Theoretical Prediction of the Hybrid Effects", Journal of the Textile Institute, Vol. 86, pp. 559-580.*
8. *Shanmugasundram O. L., (2009), "Innovation in Textile Fibers", Asian Textile Journal, January, pp 33-38.*
9. *Sheshachala D, Sandeep D. N., (2008), "Man Made Text" India.,51.*
10. *Sun Bao.,(2009),"handbook of fabric production technology", the textile institute CRC press, Bola paton, Boston, Woodhead publishing Ltd, Cambridge, England.*
11. *Siva R., (2007), "Status of Natural Dyes and Dye Yielding Plants in India". Curr. sci. 92.*
12. *Swindler J. K., (2002), "Weaving: An Analysis of The Construction of Objects", Rowmannd Litlafield Publication.*